

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings of claims in the application:

LISTING OF CLAIMS:

1. **(currently amended)** A rare earth ion ultrashort laser source ~~including on the one hand~~ comprising:

a resonant cavity (1) having a first output face (2) partially reflecting and a second reflecting face (3), ~~and on the other hand~~

a first active material (4), placed inside the resonant cavity, ~~said first active material~~ having a saturation fluency greater than  $3 \text{ J/cm}^2$  and receiving a pump luminous flux (5), said pump luminous flux being transmitted by a first solid laser pump source (7), said first solid laser pump source transmitting luminous pulses having an energy  $E_L$ , ~~characterised in that wherein:~~

- the resonant cavity (1) exhibits a length of optical path travelled by said luminous pulses greater than ~~7,5~~7.5 m so that the pulsed energy  $E_L$  is greater than 100 nJ, said optical path including at least one passage in said first active material (4),

- the ultrashort laser source comprises ~~means~~ a member for lengthening the resonant cavity (1) thereby ~~enabling to extend~~ extending the length of the optical path travelled by said

luminous pulses in the resonant cavity (1) of a ~~compact~~said  
ultrashort laser source,

- the resonant cavity (1) comprises an ABCD propagation  
matrix of said resonant cavity (1) being that is close to the a  
unit matrix so that the features of the luminous ~~beam~~pulses  
going back and forth in the resonant cavity (1) remain unchanged.

2. **(currently amended)** ~~An~~The ultrashort laser source  
according to claim 1, ~~characterised in that~~wherein the length of  
said optical path ranges between 7.5 m and 300 m.

3. **(currently amended)** ~~An~~The ultrashort laser source  
according to claim 1, ~~characterised in that the means for~~  
~~elongating~~wherein said member for lengthening the cavity (8)  
~~include~~includes at least one device ~~for elongating the cavity~~  
~~(8) including~~having at a first end a first planar mirror (9) and  
at the other end a second planar mirror (10), said first and  
second planar mirrors (9, 10) being placed respectively at the  
respective focus of a first and second concave spherical mirrors  
(11, 12), said second planar mirror (10) having a normal axis at  
its surface tilted vertically by an angle  $\theta/n$  with respect to a  
plane parallel to the plane containing the first planar mirror  
(9) so that a luminous pulse entering said device (8) under an  
angle of incidence  $\theta$  in a vertical plane and under an angle  $\Phi$  in  
a horizontal plane, with respect to the normal at the surface of

the first planar mirror (9) is subjected to  $n/2$  reflections on the second spherical mirror (10) before exiting said device.

4. (currently amended) ~~An~~ The ultrashort laser source according to claim 3, ~~characterised in that~~ comprising an input mirror, situated at ~~the~~ a front end and spaced away from the first spherical mirror (11) that enables injecting and ejecting said luminous pulses in the device for elongating the cavity.

5. (currently amended) ~~An~~ The ultrashort laser source according to claim 1, ~~characterised in that~~ wherein the first solid laser source comprises at least one second active material (5) placed inside the resonant cavity (1), said second active material (5) receiving a pump luminous flux (14).

6. (currently amended) ~~An~~ The ultrashort laser source according to claim 5, ~~characterised in that~~ wherein said pump luminous flux (14) received in said second active material is transmitted via a second solid laser pump source (15).

7. (currently amended) ~~An~~ The ultrashort laser source according to claim ~~4~~ 5, ~~characterised in that~~ wherein the number of passages travelled by said luminous pulses in each said first active material-materials (4,5) is greater than or equal to 2.

8. (currently amended) ~~An~~ The ultrashort laser source according to claim 7, ~~characterised in that~~wherein the number of passages travelled by said luminous pulses in each said first and second active material materials (4, 5) is equal to 4.

9. (currently amended) ~~An~~ The ultrashort laser source according to claim 7, ~~characterised in that it comprises~~further comprising a dichroic mirror (13) placed between said ~~active~~ first and second active materials ~~material~~ (4, 5) and the corresponding solid laser pump ~~source~~ sources (7, 15), said dichroic mirror receiving the luminous pulses from said first and second active material materials (4, 5) and reflecting said luminous pulses towards ~~the said first and second active material~~ materials (4, 5).

10. (currently amended) ~~An~~ The ultrashort laser source according to claim 1, ~~characterised in that~~wherein the first solid laser pump source (15) is a semiconductive laser.

11. (currently amended) ~~An~~ The ultrashort laser source according to claim 1, characterised in that said first active material (4, 5) comprises ytterbium ions.

12. (currently amended) ~~An~~ The ultrashort laser source according to claim ~~15~~, ~~characterised in that~~ wherein said first active material (4, 5) comprises neodymium ions.

13. (cancelled)

14. (currently amended) ~~An~~ The ultrashort laser source according to claim 2, ~~characterised in that~~ wherein the means member for elongating ~~lengthening~~ the cavity ~~include~~ includes at least one device ~~for elongating the cavity~~ (8) ~~including~~ having at a first end a first planar mirror (9) and at the other end a second planar mirror (10), said first and second planar mirrors (9, 10) being placed respectively at the respective focus of a first and second concave spherical mirrors (11, 12), said second planar mirror (10) having a normal axis at its surface tilted vertically by an angle  $\theta/n$  with respect to a plane parallel to the plane containing the first planar mirror (9) so that a luminous pulse entering said device (8) under an angle of incidence  $\theta$  in a vertical plane and under an angle  $\Phi$  in a horizontal plane, with respect to the normal at the surface of the first planar mirror (9) is subjected to  $n/2$  reflections on the second spherical mirror (10) before exiting said device.

15. (currently amended) ~~An~~ The ultrashort laser source according to claim 2, ~~characterised in that the laser source~~

further comprising ~~comprises~~ at least one second active material (5) placed inside the resonant cavity (1), said second active material (5) receiving a pump luminous flux (14).

16. (currently amended) ~~An~~ The ultrashort laser source according to claim 3, ~~characterised in that the laser source comprises~~ further comprising at least one second active material (5) placed inside the resonant cavity (1), said second active material (5) receiving a pump luminous flux (14).

17. (currently amended) ~~An~~ The ultrashort laser source according to claim 4, ~~characterised in that the laser source comprises~~ further comprising at least one second active material (5) placed inside the resonant cavity (1), said second active material (5) receiving a pump luminous flux (14).

18. (currently amended) ~~An~~ The ultrashort laser source according to claim 8, ~~characterised in that it comprises~~ comprising a dichroic mirror (13) placed between said first and second active material materials (4, 5) and the corresponding solid laser pump ~~source~~ sources (7, 15), said dichroic mirror receiving the luminous pulses from said first and second active material materials (4, 5) and reflecting said luminous pulses towards ~~the~~ said first and second active material materials (4, 5).

19. (new) The ultrashort laser source according to claim 3, wherein  $n$  is the number of passages of the luminous pulses in the vertical plane of the at least one device (8) before exiting through the same path.

20. (new) The ultrashort laser source according to claim 14, wherein  $n$  is the number of passages of the luminous pulses in the vertical plane of the at least one device (8) before exiting through the same path.